CLAIMS

What is claimed is:

1.   A method comprising:

receiving an image; and

creating a smaller representation of the image from a wavelet representation of the image, including selecting display size of the smaller representation of the image based on content of the image and at least one physical property of a display device to display the smaller representation of the image.

2.   The method defined in Claim 1 further comprising selecting an output shape for the smaller representation based on content of the image and at least one physical property of a display device to display the smaller representation of the image.

3.   The method defined in Claim 1 further comprising selecting an output application for the smaller representation based on content of the image and at least one physical property of a display device to display the smaller representation of the image.

4.   The method defined in Claim 1 further comprising selecting an output shape and application for the smaller representation based on content of the image and at least one physical property of a display device to display the smaller representation of the image.

5. The method defined in Claim 1 further comprising selecting an output resolution for the smaller representation based on content of the image and at least one physical property of a display device to display the smaller representation of the image.

6. The method defined in Claim 1 further comprising selecting an output shape, resolution and application for the smaller representation based on content of the image and at least one physical property of a display device to display the smaller representation of the image.

7. The method of claim 1, wherein the at least one physical property includes at least one selected from a group consisting of dots per inch resolution, absolute pixel resolution, contrast ratio, brightness, viewing distance, pixels per viewing angle, and gain function.

8. The method of claim 1, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling the image a number of times large enough to cause an entirety of the smaller representation of the image to be visible on the display device.

9. The method of claim 1, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling the image a number of times dependent proportionately on a ratio of coarse structures in the image to fine structures in the image.

10.   The method of claim 1, wherein creating a smaller representation of the image from a wavelet representation of the image includes suppression of noisy wavelet coefficients.

11.   The method of claim 1, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling the image a number of times according to a ratio of wavelet coefficients in a class of significant features to wavelet coefficients in a class of insignificant features.

12.   The method of claim 1, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling a segment of the image a number of times to approximate a given fixed size window.

13.   The method of claim 1, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling a segment of the image a number of times to approximate a given fixed shape.

14.   The method of claim 1, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling a segment of the image to arrive at which a resolution for the segment that approximates a given fixed resolution.

15. The method of claim 1, wherein creating a smaller representation of the image from a wavelet representation of the image includes varying display window size of a segment of the image for a given fixed segment shape.

16. The method of claim 1, wherein creating a smaller representation of the image from a wavelet representation of the image includes varying display window size of a segment of the image for a given fixed segment resolution.

17. The method of claim 1, wherein creating a smaller representation of the image from a wavelet representation of the image includes varying segment shape of a segment of the image for a given fixed display window size.

18. The method of claim 1, wherein creating a smaller representation of the image from a wavelet representation of the image includes varying resolution of a segment of the image for a given fixed display window size.

19. The method of claim 1, wherein the size of the smaller representation of the image depends on dots per inch resolution of the display device.

20. The method of claim 1, wherein the size of the smaller representation of the image depends on pixels per viewing angle of the display device.

21. The method of claim 19, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling the image a number

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of times so as to cause a number of dots in a diameter of the object to be at least as large as a number of dots in the minimal visible object diameter.

22.   The method of claim 1, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling the image a number of times at which a trend changes from an importance measure increasing each time to the importance measure decreasing each time.

23.   The method of claim 22, wherein the importance measure is energy.

24.   The method of claim 22, wherein the importance measure is entropy.

25.   The method of claim 22, wherein the importance measure is an importance measure of wavelet coefficients in a selected subband.

26.   The method of claim 22, wherein the importance measure is an importance measure of a sum of wavelet coefficients in weighted subbands.

27.   The method of claim 22, wherein the importance measure is a maximum importance measure of wavelet coefficients from all subbands.

28.   The method of claim 1, wherein creating a smaller representation of the image from a wavelet representation of the image includes partitioning the image into segments and downsampling each of the segments a number of times.

29.   The method of claim 28 wherein partitioning the image into segments includes partitioning the image by JPEG2000 code units.

30.   The method of claim 1, wherein creating a smaller representation of the image from a wavelet representation of the image includes partitioning the wavelet domain into cells.

31.   The method of claim 30, wherein cells comprise JPEG 2000 units.

32.   The method defined in claim 1 further comprising displaying only parts of the image that are associated with a particular display scale.

33.   The method defined in claim 32 further comprising selecting segments for display that are grouped into connected components.

34.   The method defined in claim 32 further comprising displaying only some of the segments of an image based on whether selected segments are contained in a bounding box.

35. A machine-readable medium that provides instructions that, when executed by a machine, cause the machine to perform operations comprising:

receiving an image; and

creating a smaller representation of the image from a wavelet representation of the image, including selecting display size of the smaller representation of the image based on content of the image and at least one physical property of a display device to display the smaller representation of the image.

36. The machine-readable medium of claim 35, wherein the at least one physical property includes at least one selected from a group consisting of dots per inch resolution, absolute pixel resolution, contrast ratio, brightness, viewing distance, pixels per viewing angle, and gain function.

37. The machine-readable medium of claim 35, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling the image a number of times large enough to cause the smaller representation of the image to be entirely visible on the display device.

38. The machine-readable medium of claim 35, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling the image a number of times dependent proportionately on a ratio of coarse structures in the image to fine structures in the image.

39.　　The machine-readable medium of claim 35, wherein creating a smaller representation of the image from a wavelet representation of the image includes suppression of noisy wavelet coefficients.

40.　　The machine-readable medium of claim 35, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling the image a number of times according to a ratio of wavelet coefficients in a class of significant features to wavelet coefficients in a class of insignificant features is highest.

41.　　The machine-readable medium of claim 35, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling a segment of the image a number of times to approximate a given fixed size window.

42.　　The machine-readable medium of claim 35, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling a segment of the image a number of times to approximate a given fixed shape.

43.　　The machine-readable medium of claim 35, wherein creating a smaller representation of the image from a wavelet representation of the image includes

downsampling a segment of the image a number of times to approximate a given fixed resolution.

44.   The machine-readable medium of claim 35, wherein the size of the smaller representation of the image depends on a number of dots depends proportionately on a ˌdots per inch resolution of the display device.

45.   The machine-readable medium of claim 35, wherein the size of the smaller representation of the image depends on a number of dots depends proportionately on a pixels per viewing angle of the display device.

46.   The machine-readable medium of claim 40, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling the image a number of times so as to cause a number of dots in a diameter of the object to be at least as large as a number of dots in the minimal visible object diameter.

47.   The machine-readable medium of claim 35, wherein creating a smaller representation of the image from a wavelet representation of the image includes downsampling the image a number of times at which a trend changes from an importance measure increasing each time to the importance measure decreasing each time.

48.   The machine-readable medium of claim 47, wherein the importance measure is energy.

49.   The machine-readable medium of claim 47, wherein the importance measure is entropy.

50.   The machine-readable medium of claim 47, wherein the importance measure is an importance measure of wavelet coefficients in a selected subband.

51.   The machine-readable medium of claim 47, wherein the importance measure is an importance measure of a sum of wavelet coefficients in weighted subbands.

52.   The machine-readable medium of claim 42, wherein the importance measure is a maximum importance measure of wavelet coefficients from all subbands.

53.   The machine-readable medium of claim 35, wherein creating a smaller representation of the image from a wavelet representation of the image includes partitioning the image into segments and downsampling each cell a number of times.

54.   The machine-readable medium of claim 49, wherein partitioning the image into segments includes partitioning the image by JPEG 2000 code units.

55.   An apparatus comprising:

a receiving unit to receive an image; and

a processing unit coupled with the receiving unit, the processing unit to create a smaller representation of the image from a wavelet representation of the image based on content of the image and at least one physical property of a display device to display the smaller representation of the image.

56. The apparatus of claim 55, wherein the at least one physical property includes at least one selected from a group consisting of dots per inch resolution, absolute pixel resolution, contrast ratio, brightness, viewing distance, pixels per viewing angle, and given function.

57. The apparatus of claim 55, wherein, to create a smaller representation of the image from a wavelet representation of the image, the processing unit downsamples the image a number of times large enough to cause an entirety of the smaller representation of the image to be visible on the display device.

58. The apparatus of claim 55, wherein, to create a smaller representation of the image from a wavelet representation of the image, the processing unit downsamples the image a number of times dependent proportionately on a ratio of coarse structures in the image to fine structures in the image.

59. The apparatus of claim 55, wherein, to create a smaller representation of the image from a wavelet representation of the image, the processing unit performs suppression of noisy wavelet coefficients.

60. The apparatus of claim 55, wherein, to create a smaller representation of the image from a wavelet representation of the image, the processing unit downsamples the image a number of times according to a ratio of wavelet coefficients in a class of significant features to wavelet coefficients in a class of insignificant features is highest.

61. The apparatus of claim 55, wherein, to create a smaller representation of the image from a wavelet representation of the image, the processing unit downsamples a segment of the image a number of times to approximate a given fixed size.

62. The apparatus of claim 55, wherein, to create a smaller representation of the image from a wavelet representation of the image, the processing unit downsamples a segment of the image a number of times to approximate a given fixed shape.

63. The apparatus of claim 55, wherein, to create a smaller representation of the image from a wavelet representation of the image, the processing unit downsamples a segment of the image a number of times to approximate a given fixed resolution.

64. The apparatus of claim 55, wherein the size of the smaller representation of the image depends on dots per inch resolution of the display device.

65. The apparatus of claim 64, wherein, to create a smaller representation of the image from a wavelet representation of the image, the processing unit downsamples the image a number of times so as to cause a number of dots in a diameter of the object to be at least as large as a number of dots in the minimal visible object diameter.

66. The apparatus of claim 55, wherein, to create a smaller representation of the image from a wavelet representation of the image, the processing unit downsamples the image a number of times at which a trend changes from an importance measure increasing each time to the importance measure decreasing each time.

67. The apparatus of claim 66, wherein the importance measure is energy.

68. The apparatus of claim 66, wherein the importance measure is entropy.

69. The apparatus of claim 66, wherein the importance measure is an importance measure of wavelet coefficients in a selected subband.

70. The apparatus of claim 66, wherein the importance measure is an importance measure of a sum of wavelet coefficients in weighted subbands.

71. The apparatus of claim 66, wherein the importance measure is a maximum importance measure of wavelet coefficients from all subbands.

72. The apparatus of claim 55, wherein, to create a smaller representation of the image from a wavelet representation of the image, the processing unit is to partition the image into segments and downsample each cell a number of times.

73. The apparatus of claim 72, wherein, to partition the image into segments, the processing unit is to partition the image by JPEG2000 code units.

74. A method comprising:

receiving an image; and

selecting a specific resolution segment of the image, wherein the segment is determined by border shape, size, segment location and segment resolution in a wavelet domain.

75. The method defined in Claim 74 wherein selecting a specific resolution segment is based on page layout for printing.

76. An apparatus comprising:

means for receiving an image; and

means for selecting a specific resolution segment of the image, wherein the segment is determined by border shape, size, segment location and segment resolution in a wavelet domain.

77. A machine-readable medium that provides instructions that, when executed by a machine, cause the machine to perform operations comprising:

receiving an image; and

selecting a specific resolution segment of the image, wherein the segment is determined by border shape, size, segment location and segment resolution in a wavelet domain.

78. A method comprising:

selecting a plurality of image segments for displaying in a display area within specific borders;

selecting display scales for each of the plurality of segments, where at least two of the plurality of segments have different scales; and

displaying the plurality of image segments to cover the display area.

79. The method defined in claim 78 further comprising upsampling one or more of the plurality of segments.

80. The method defined in claim 79 wherein upsampling one or more of the plurality of segments comprises upsampling segments from an LL component by a factor.

81. The method defined in claim 78 further comprising enhancing one or more of the plurality of segments.

82.   The method defined in claim 78 further comprising blurring one or more of the plurality of segments.

83.   The method defined in claim 78 further comprising warping one or more of the plurality of segments.

84.   An apparatus comprising:

means for selecting a plurality of image segments for displaying in a display area within specific borders;

means for selecting display scales for each of the plurality of segments, where at least two of the plurality of segments have different scales; and

means for displaying the plurality of image segments to cover the display area.

85.   A machine-readable medium that provides instructions that, when executed by a machine, cause the machine to perform operations comprising:

selecting a plurality of image segments for displaying in a display area within specific borders;

selecting display scales for each of the plurality of segments, where at least two of the plurality of segments have different scales; and

displaying the plurality of image segments to cover the display area.